



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,932	06/29/2006	Robert Lewis Clarke	100770.0025US	2466

24392 7590 03/30/2011

FISH & ASSOCIATES, PC  
ROBERT D. FISH  
2603 Main Street  
Suite 1000  
Irvine, CA 92614-6232

EXAMINER

PHASGE, ARUN S

ART UNIT

PAPER NUMBER

1724

NOTIFICATION DATE

DELIVERY MODE

03/30/2011

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

rfish@fishiplaw.com  
patents@fishiplaw.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/596,932	<b>Applicant(s)</b> CLARKE ET AL.	
	<b>Examiner</b> Arun S. Phasge	<b>Art Unit</b> 1724	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 March 2011.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Claim Rejections - 35 USC § 103***

Claims 1, 4-5, 7-12, 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bradbury in view of Velin all of record.

Bradbury discloses a method of treating a solution comprising nitrate and a metal halide, such as sodium chloride (see col. 2, lines 56-60) comprising:

(I) subjecting the solution to an electrochemical reduction to thereby reduce the nitrate to at least ammonia (see col.2, line 50);

(II) subjecting the solution from step (I) to an electrochemical oxidation to thereby oxidize the ammonia to nitrogen (see col. 2, line 55), and

(III) subjecting the solution from step (II) to an electrochemical reduction which would inherently reduce the metal hypohalite formed by the anodic oxidation of chloride (col. 2, line 60) to the metal halide (see figure 4 and col. 23-30).

Bradbury further discloses a step of eluting an ion exchange column to which nitrate is bound with an eluent that includes a metal halide to thereby form the solution comprising the nitrate and the metal halide and using the regenerated halide from the

Art Unit: 1724

electrolytic treatment to elute the nitrate from the ion exchange resin (see col. 4, lines 1-10).

Bradbury further discloses a pH value that falls within the claimed range (see example 1 in columns 5-6). The patent further teaches the use of a membrane (see col. 6, lines 3-10).

The Bradbury patent fails to disclose the concentration of the nitrate and metal halide before the electrochemical reduction step as presently amended and after treatment as further claimed.

Normally, change in concentration is not patentable modification; however, such change may impart patentability to process if ranges claimed produce new and unexpected result which is different in kind and not merely in degree from results of prior art; such ranges are termed "critical" ranges, and applicant has burden of proving such criticality; even though applicant's modification results in great improvement and utility over prior art, it may still not be patentable if modification was within capabilities of one skilled in art; more particularly, where general conditions of claim are disclosed in prior art, it is not inventive to discover optimum or workable ranges by routine experimentation. *In re Aller et al*, 105 U.S.P.Q. 233 CCPA (1955).

The Bradbury patent fails to disclose the steps performed in a single electrochemical compartment, which would be accomplished by the reversal of polarity. The patent further fails to teach the exact same electrodes for the anode and the cathode.

The Velin patent is cited to show another process for the removal and destruction of nitrate in water (see abstract). The reference further discloses that the reversal of the electrode reactions can be accomplished by either redirecting the electrolyte from one to the other or the reversing of polarities of the electrodes (see page 3, fourth paragraph). The patent further teaches the use of conventional material, such as Platonized titanium and carbon materials, such as graphite which would render obvious the carbon felt claimed, because such a conventional shape of a type of carbon would have been rendered obvious to one having ordinary skill in the art (see page 3 third paragraph).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Bradbury by the teachings of Velin.

One having ordinary skill in the art would have been motivated to do this modification, because Velin patent teaches the electrolytic removal and destruction of nitrates from solutions by the reversal of polarity and the use of the similar types of electrodes.

The Bradbury patent discloses the feeding of the solution to the central compartment between two anion membranes and a resin and moving the nitrate and other salts to the cathode compartment for the electrochemical nitrate destruction (see abstract).

The Velin reference discloses that the method disclosed therein, where the nitrate containing eluent is directly destroyed in the two step treatment is a "very simple and efficient alternative" for removal and destruction (see page 2, lines 1-3). The eluent containing nitrate solution is electrochemically destroyed in the catholyte compartment first followed by the anolyte compartment.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Bradbury by the teachings of Velin.

One having ordinary skill in the art would have been motivated to do this modification, because Velin teaches that nitrates can be directly destroyed by directly sending the nitrate to the cathode compartment followed by the anode compartment and recycling the eluent back to regenerate the ion exchanger (see page 4, last two paragraphs).

Claims 6 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bradbury in view of Velin as applied to claims above, and further in view of Kaczur et al. (Kaczur), U.S. Patent 5,376,240.

The Bradbury and Velin patents fail to disclose the use of carbon felts as the cathode. The Kaczur patent is cited to show the functional equivalence between the cathode materials recited in Bradbury and Velin and the claimed carbon felt (see col. 6, lines 60-65 and col.7, lines 32-37).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Bradbury by the teachings of Kaczur.

One having ordinary skill in the art would have been motivated to do this modification, because Kaczur teaches the functional equivalence between the materials taught in Bradbury and the carbon felt claimed.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 4-15 have been considered but are moot in view of the new ground(s) of rejection.

With regard to the Bradbury patent applicants argued, "the reduction and oxidation processes in Bradbury are performed on the nitrate in the electrolyte in the cathode and anode compartments, while the remainder of the regenerate leaves the device as regenerated eluent. Such is entirely inconsistent with the claimed process where the totality of the eluent (i. e., without any separation of components) is electrochemically treated and then reused as regenerated eluent."

The Velin reference discloses that the method disclosed therein, where the nitrate containing eluent is directly destroyed in the two step treatment is a "very simple and efficient alternative" for removal and destruction (see page 2, lines 1-3). The eluent containing nitrate solution is electrochemically destroyed in the catholyte compartment first followed by the anolyte compartment.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Bradbury by the teachings of Velin.

One having ordinary skill in the art would have been motivated to do this modification, because Velin teaches that nitrates can be directly destroyed by directly sending the nitrate to the cathode compartment followed by the anode compartment and recycling the eluent back to regenerate the ion exchanger (see page 4, last two paragraphs).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arun S. Phasge whose telephone number is (571) 272-1345. The examiner can normally be reached on MONDAY-THURSDAY, 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 1724

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Arun S. Phasge/  
Primary Examiner, Art Unit 1724

asp